Data Plane for Resilient Network Interconnect

János Farkas
Balázs Péter Gerő
Panagiotis Saltsidis
Introduction

- Data paths do not depend on the applied control protocol
- How to implement the data paths within the 802.1 architecture?
- Let’s cover the most complex case
  - Overlay tunnel within the network (single tunnel between a node-pair)
  - Support both congruent and non-congruent forwarding
Forwarding within an NI bridge

1) frame received on NI port

- For example
Forwarding within an NI bridge

2) frame received on network port

For example

- Frame received on network port
  - yes: Tunneled frame?
    - yes: Decapsulate
      - yes: Active node?
        - yes: Forward frame to an NI port
        - no: Tunnel to passive?
          - yes: Encapsulate
          - no: Forward frame to network port
    - no: Passive node OR Network internal DA?
      - yes: Forward frame to network port
      - no: Forward frame to an NI port
Bridge component model is suitable to illustrate what needs to be implemented in the data plane.
Edge Bridge using LAG features and PBB encapsulation

- The Network is a PBN
- S-tagged NI
- LAG Distributor of the Active Gateway decides whether the Service VID is tunneled
- Single ingress to the relay from NI supports MAC learning for non-congruent services too
- Overlay tunnel between NI nodes is implemented by 802.1ah encapsulation
  - green B-VID is the tunnel B-VID
- NI node K is the Active Gateway for the brown S-VID
- NI node K is Passive for the blue S-VID
- Note that Gateway (re)-selection is just setting the VID member sets in the S-Components
Alternatively, Backbone Edge Bridge using LAG features

- The Network is a PBBN

- S-tagged NI

- LAG Distributor of the Active Gateway decides whether the Service VID is tunneled

- A B-VID is used as overlay tunnel
  - green B-VID is the tunnel B-VID

- NI node K is the Active Gateway for the brown S-VID

- NI node K is Passive for the blue S-VID
Edge Bridge using LAG features and generic tunneling

› The Network is a PBN

› S-tagged NI

› LAG Distributor of the Active Gateway decides whether the Service VID is tunneled

› Generic Overlay tunnel between NI nodes
  – Green S-VID and grey C-VID are NI node internal VIDs only applied in the bridge component model description

› NI node K is the Active Gateway for the brown S-VID

› NI node K is Passive for the blue S-VID
Summary

› The model presented here is proposed to be used as the data plane for the Resilient Network Interconnect

› Both congruent and non-congruent data paths can be supported by the same components

› Overlay tunneling can also be supported
  – Direct physical link between NI nodes is also covered
  – Tunneling support provides connectivity between NI nodes as long as the Network is not split

› The Gateway Selection functionality of the control protocol only has to adjust VID member set for a couple of ports